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DESCRIPTIONS OF FIVE NEW SPECIES OF CANADIAN ICHNEUMONIDAE.*

BY G. STUART WALLEY,
Ottawa, Ontario.

Glypta exartemae n. sp.

Female. Length 8 mm.; exserted portion of ovipositor 5 mm. Temples rather flat, strongly sloping inwards, broadest above, narrowing strongly below, especially narrow where occipital carina bends outwards above genae to approach eye, at this point temples distinctly narrower than malar space. Eyes prominently convex; head transverse, width including eyes distinctly greater than height. Clypeus prominently convex, apical margin broadly rounded with slightly median truncation; malar space one-fifth less than basal width of mandible. Head with numerous distinct punctures and a minute tubercle formed by the convergence of two frontal carinae above antennae. Temples shining with a few sparse setigerous punctures and fine vertical striae adjacent occiput. Face distinctly narrower than eye length. Notauli impressed and defined by coarser punctures anteriorly; mesoscutum and scutellum shining, with numerous distinct punctures; mesopleura polished with smaller more scattered punctures; speculum as well as region before and above for some distance highly polished, impunctate; metapleura shining with distinct evenly spaced punctures and a few striae below leading to strong metapleural tooth. Propodeum somewhat shining with distinct well separated punctures, median longitudinal carinae defined but not strong, slightly diverging posteriorly; apical transverse carina, well defined, located at apical three-fourths of propodeum; costulae scarcely traceable. Abdomen moderately stout, shining, strongly punctate, the first tergite medianly tumidly elevated with basal carinae weak and not defined beyond basal third; four apical tergites with weak puncturation only at base. Sheath of ovipositor scarcely longer than abdomen.

Black. Scape and pedicel except for whitish spot on latter below black; flagellum black at base becoming blackish to brown apically. Clypeus, palpi and mandibles except tips, middle and anterior margin of pronotum, tegulae, spot before, front coxae and trochanters, middle and hind apical trochanters, narrow bases of all tibiae, broad median band on hind tibia and basal half of all except ultimate middle and hind tarsal segments, white. All knees narrowly whitish; front and middle femora, tibiae and front tarsi reddish, the latter pale reddish; middle and hind coxae and hind femora reddish; hind basal trochanters, narrow base and apex of hind femora blackish; hind tibia with broad sub-basal and apical black bands, the same pattern very faintly repeated on middle tibiae; middle and hind tarsal segments and calcaria black or blackish on apical half

*Contribution from the Division of Systematic Entomology, Entomological Branch, Department of Agriculture, Ottawa.

except ultimate tarsal segment which is only narrowly paler at base. Mesosternum joined with large spot on lower posterior half of mesopleura reddish; metapleura reddish.

Male. Differs slightly from the female in having the malar space whitish adjacent mandible; entire middle trochanters whitish; prosternum largely white; lower half of mesopleura behind epicnemia reddish; hind tibial and tarsal bands slightly more broadly blackish than in the female.

Holotype—♀, St. Davids, Ont., June 26, 1933, (Wm. L. Putman); No. 3798 in the Canadian National Collection, Ottawa, Ont.

Allotype—♂, St. Davids, Ont., June 20, 1933, (Wm. L. Putman).

Paratypes—5 ♀ ♀, St. Davids, Ont., June 22, 24, 26, 1933, (Wm. L. Putman); ♀, Bobcaygeon, Ont., June 29, 1932, (J. McDunnough). Paratype in United National Museum.

Host—All the above specimens from St. Davids, Ont., were reared from an unidentified species of *Exartema* which was found feeding on *Viburnum*. The Bobcaygeon female was reared from an unidentified microlepidopterous larva which fed on *Myrica*.

Note.—The paratypes vary somewhat in the relative stoutness of thorax and abdomen. In the most slender specimen the first tergite is one-fifth longer than broad at apex; in the stoutest specimen it is no longer than broad. The type is somewhat intermediate. In one paratype the red on the mesopleura is as extensive as in the male.

The species traces to *pulchripes* Cress. in Cresson's table of species. I have examined the type of *pulchripes* which is a female from West Virginia. It is smaller, a little more slender with the ovipositor a little longer; the front and middle legs are whitish with the femora only faintly reddish apically; the metapleura are black and the reddish mesopleural spot is small and round and located near the middle of the segment; the frontal tubercle is also entirely lacking.

Glypta infumata n. sp.

Female.—Length 10 mm.; exserted portion of ovipositor 14 mm. Temples rather flat and sloping inwards, two-thirds as broad as eyes; malar space very broad, approximately one-third greater than basal width of mandible; Clypeus long, convex; face only moderately elevated at middle, distinctly punctate, the punctures densest below antennae, clypeus with very few punctures except at base, face distinctly broader than eye length; frontal tubercle very weak, front transversely rugulose above antennae, toward vertex the rugulae confused with punctures; vertex moderately punctate; temples polished with fewer finer punctures. Punctures of head, thorax, including coxae and abdomen to lesser extent giving rise to rather dense erect blackish hairs. Thorax strongly and closely punctate, base of propodeum more shining with fewer punctures, propodeal carinae obsolete, transverse apical carina very poorly defined, posterior face of propodeum not perpendicular. First tergite one-fourth longer than broad at apex, convex, without carinae; coarsely punctate with small mid-apical portion polished, impunctate, punctures sparse near base, elsewhere rather dense and in region of lateral subapical depressions longitudinally aciculate; second, third

and fourth tergites densely rather coarsely punctate except for narrow apical margins, in part weakly longitudinally aciculate; apical tergites shining, almost impunctate except at base of fifth. Nervulus slightly postfurcal, nervellus broken at posterior three-fourths.

Head including antennae, thorax entirely, all coxae and basal trochanters, abdominal tergites and sheath of ovipositor pure black; palpi, tips of mandibles and apex of clypeus dark rufo-piceous; legs red with the three apical tarsal segments dusky towards apices above; base of apical segment of posterior trochanters piceous. Wing veins dark brown, wing membrane infumate with brown.

Holotype—♀, Nordegg, Alta., June 8, 1921, (J. McDunnough); No. 3670 in the Canadian National Collection, Ottawa, Ont.

Paratypes—2♀♀, same data as holotype; ♀, East Coast of James Bay, Que., Sept. 6, 1920, (F. Johansen). Paratype in the United States National Museum.

Notes—The paratypes resemble the type very closely in both color and structure. The James Bay specimen is a little smaller and lacks all traces of carinae on the propodeum. The two Nordegg paratypes have the apical segments of all the trochanters blackish.

In Cresson's synopsis (Trans. Am. Ent. Soc. III, 151, 1870) the species traces to *rubripes* Cress., but is at once distinguished by its non-areolated propodeum, longer malar space, infumate wings and densely pilose body. It does not appear to be very closely allied to any of the species described by Cresson.

Aphanodon luctuosus n. sp.

Female—Length 7 mm.; exserted portion of ovipositor 1.5 mm. Temples broadly rounded and strongly sloping; face one-fifth broader than distance from antenna to base of clypeus, median portion longitudinally swollen, moderately densely punctured, more sparsely so on swollen portion; malar space almost three-fourths basal width of mandible; genae rounded, obscurely punctate, finely granular as is malar space; clypeus convex, shining, finely reticulately sculptured with very few obscure punctures; antennae slender, 34 segmented, each segment of apical half of flagellum slightly dilated at middle. Mesoscutum with rather dense distinct punctures; notauli absent; mesopleura and metapleura rather shining with numerous large punctures separated for the most part by about their own diameter; propodeum rather dullish laterally, rugoso-punctate, at middle more shining with irregular transverse rugulae between a pair of irregular feebly defined median longitudinal carinae; transverse apical carina well defined; lateral carina weak especially basal to spiracles. Nervulus post-furcal one-half its length; nervellus broken at posterior two-thirds. First abdominal tergite convex, spiracle elevated on a low tubercle slightly beyond basal third of segment, lateral margins of tergite gradually diverging posteriorly, width at apex one-half median length; second tergite as broad at apex as median length; first tergite finely rugose with shallow punctures, median basal area in front of spiracles and narrow apex of tergite polished; second tergite finely transversely rugulose to faintly reticulate apically with scattered shallow punctures; following tergites more shining, faintly shagreened. Sheath of ovipositor as long as first tergite.

Black, legs reddish. Clypeus, maxillary palpi, large spots on middle of

mandible above, malar space and tegulae pale creamy yellowish. Narrow apices of hind femora, hind tibia and tarsi almost black, the hind tibia shading to a dark brownish toward base. Small reddish spot on margin of prothorax just above front coxae.

Male—More slender than the female; median carinae of propodeum less irregular and more strongly defined; first abdominal tergite not as evenly convex as in female more flattened laterally between spiracle and apex.

Black. Clypeus, palpi, mandibles except tips, spot on apex of scape below, face except for narrow lower margin of antennal sockets and broad median stripe joined to a narrower arc defining base of clypeus, anterior orbits to opposite antennae, small spot on vertex at upper extremity of eye, stripe on margin of mesoscutum in front of tegulae, small dot before tegulae, spot on prothorax above coxae, spot on front coxae and trochanters, creamy yellowish. Extreme apices of abdominal tergites except first yellowish-stramineous. Color otherwise as described for the holotype.

Holotype—♀, Mt. Lyall, Gaspe Co., Que., 1500 ft., July 31, 1933. (W. J. Brown); No. 3799 in the Canadian National Collection, Ottawa, Ont.

Allotype—♂, Same locality as holotype, July 13, 1933.

Paratypes—♂, ♀, Same locality as holotype, July 26, 1933.

Notes—The female paratype in addition to having the yellow markings described for the type, has an obscure pale dot on the anterior orbits opposite the antennae and another at the top of the eye, a yellowish stripe on the mesoscutum before the tegulae and a small spot on prothorax before tegulae and another minute dot below tegulae on mesopleura. The hind tibia are reddish-brown becoming dark brown toward the apex and the abdominal tergites except the first one have their apices narrowly pale as in the male.

The male paratype has the black facial stripe narrower and black arc is lacking at the base of the clypeus, only the foveae being blackened.

The above species is easily distinguished from *Aphanodon agilis* (Cress.) by the absence of any red on the abdominal tergites. In *agilis* the first three tergites are uniformly reddish and with fine granular sculpture without punctures. In typical *agilis* the front coxae and middle and hind femora are rufopiceous to blackish.

Syzeuctus eximius n. sp

Female—Length 11 mm., ovipositor 8 mm. Head transverse, oval, temples weakly convex, strongly sloping inwardly so that they are nearly perpendicular to longitudinal axis of body; postvertex with scattered punctures; temples polished with only sparse very fine setigerous punctures above, a few coarser punctures below adjacent genae; vertex and front with evenly distributed well separated, shallow, punctures; front distinctly concave; face similarly punctate, convex, with a slight impression on either side below antennae; clypeus separated from face by a broad shallow groove, polished with a few scattered punctures; cheeks shagreened; malar space scarcely as long as basal width of mandible. Epomia entirely absent; thorax and propodeum coarsely and rather densely punctate, the punctures densest and coarsest on propodeum, least numerous on mesopleura and finest on prescutum; apical carina of propodeum distinct, pleural carinae

poorly defined; longer calcarium of hind tibia not quite half as long as hind basitarsus; hind tibia one-third longer than femora, basitarsus as long as three following joints; nervellus normal, discoidella at lower third, weakly defined. Abdomen faintly shagreened with sparse fine punctures; first tergite polished, one-third longer than wide at apex, sides beyond spiracles distinctly diverging; tergites 2-4 as long as broad at apex, the following much shorter.

Head and thorax black ornamented with greenish yellow; legs and abdomen largely red; yellow markings as follows: orbits, broadly in front more narrow above and behind and narrowly interrupted at lower angle of eyes, cheeks, mandibles except tips, tegulae, spot below, stripe in front, anterior margin of prothorax, broad arcuate diagonal stripe on mesopleura, triangular spot on mesonotum shortly before tegulae, margins of scutellum, spot on mesonotum in front of scutellum, postscutellum at middle, small spot below posterior wing, dot above spiracle, spot on metapleura above coxa, short median longitudinal dash on propodeum and stripe on outer side of all coxae. Clypeus pale brown, coxae and basal trochanters dark brown, legs beyond red, hind tarsi dusky red; abdominal tergites red, two apical tergites with dusky, apical sternite and sheaths blackish.

Male.—Resembles the female in structure; head and thorax more highly ornamented with yellow than in the female. Head maculate with yellow as follows: entire face except narrow median longitudinal black stripe joined below with blackish basal groove of clypeus and above with black frontal area, orbits entirely, broadly in front and more narrowly behind, cheeks, clypeus except for brownish margin, mandibles except blackish tips. Thoracic yellow markings situate as described for female, but broader and more conspicuous especially on prothorax, mesoscutum and propodeum; front coxae except extreme base, middle coxae except bases and inner spot, posterior aspect of hind coxae, entirely yellow; front and middle trochanters clear yellow in front, front femora yellowish in front throughout length; middle tarsi uniformly dusky. Abdomen red, first tergite black except narrow midapical portion and small yellow dot in front of spiracle; lateral margins of second tergite and to a lesser extent third and following, narrowly blackish; genital valves blackish.

Holotype—♀, Aweme, Man., July 4, 1925, (R. D. Bird); No. 3671 in the Canadian National Collection, Ottawa.

Allotype—♂, Aweme, Man., July 9, 1924, (R. D. Bird).

Paratypes—♂, same data as allotype; ♂, Colo., 2061 Coll. C. F. Baker; ♀, Colo., 1581 Coll. C. F. Baker; ♀, Monument Park, Colo., July 19, 1877, Coll. C. V. Riley; ♂, Glendale, Nev., Apr. 5, 1930, David E. Fox, 229-B30, *Chrysothamnus paniculatus*, 886. First, third and remainder of paratypes in United States National Museum.

The two female paratypes differ only slightly from the holotype. In both the former the orbits are not interrupted with blackish at the lower angle of the eyes. In the Monument Park paratype the yellow lateral spot on the propodeum above the hind coxae is larger than in the type and the median stripe extends to the basal one-fifth of the propodeum.

In the male paratypes from Colorado and Manitoba the clypeal groove is blackish only laterally. The Aweme male paratype has the black on the prothorax reduced to a narrow median stripe and the first tergite is reddish beyond the apical three-fourths with the extreme apex yellowish; also the yellow stripe on the hind coxae is joined apically to a yellow annulus. The Colorado male has the first tergite as in the Aweme paratype, the propodeal yellow spots are smaller and the usual median stripe is reduced to an obscure spot adjacent the carina. The Nevada male is considerably smaller (length 7.5 mm.) than the other specimens before me. In it the black facial stripe is very broad, almost as broad as the black on the front, the mesonotal and propodeal spots are very large, in the latter the lateral spot is joined by a yellow arc along the transverse carina with the median stripe; the apex of the first tergite is broadly pale creamy yellow, the apex of the second more narrowly so with the red color basal of the second tergite obscured with blackish; the third tergite with apical margin with a trace of yellowish; hind tarsi pale reddish.

Aenoplex longicauda n. sp.

Female.—Length, 5 mm.; antennae, 3.5 mm.; ovipositor 4.5 mm.

Head swollen, distinctly wider than any other region of body; temples broadly rounded, at widest point fully as wide as eyes; ocelli small, lateral ocelli removed from eyes by fully twice their greatest diameter; cheeks broadly rounded; malar space slightly less than basal width of mandible; inner margins of eyes diverging below; antennae 24 segmented (left flagellum missing); first flagellar segment three and one-half times as long as thick at apex, equal in length to the second, the third very slightly shorter; head minutely granularly subopaque; clypeus with a few coarse punctures, the apex shining, two denticles at middle only weakly developed. Thorax with mesoscutum sculptured as in head; notauli distinct for a short distance in front, but not defined on posterior two-thirds of scutum; pronotum and mesopleura more shining, the former obscurely shagreened and with a few transverse striae on lower half between epomia and posterior margin, the latter feebly shagreened with a few very poorly defined transverse striae and scattered shallow punctures; propodeum dullish above, more shining laterally and behind, carinae regularly defined, carinae adjacent petiolarea more elevated than elsewhere; basal region of propodeum irregularly somewhat transversely rugulose; pleural area transversely striate on lower half, weakly shagreened and shining above. Abdomen not distinctly longer than head and thorax; three basal tergites granularly subopaque, tergites beyond shining, faintly shagreened; first tergite two and one-half times as wide at apex as at base, dorsal carinae not defined beyond basal third; ovipositor almost as long as body. Stigma three times as long as wide; radial cell (measured along metacarpus) as long as stigma; nervulus situate a short distance beyond basal vein; nervellus broken at posterior fourth.

Black; mandibles, scape and pedicel below, palpi, apices of three basal flagellar segments obscurely, piceous; legs reddish testaceous hind tibia in region of apical third and hind tarsi especially above, infuscate; wing irridescent

very lightly stained with brownish; veins and stigma dark brown, the latter with small pale spot at base and apex; tegulae dark brown, wing base dirty whitish.

Holotype—♀, Merivale, Ont., May 11, 1933, (G. S. Walley); No. 3800 in the Canadian National Collection, Ottawa.

Notes—In Cushman's tabulation of species (Proc. U.S.N.M., 53, 459, 1917) runs closest to *betulaecola* Ashm., but from that species at once distinguished by its thicker head, broader temples, shorter three basal segments of flagellum and the much longer ovipositor.

To Mr. R. A. Cushman I am indebted for several notes which proved most helpful in preparing the above descriptions and also for the privilege of studying additional specimens of *Syzeuctus eximius* from United States localities.

AN ADDITION TO THE ODONATAN FAUNA OF ALBERTA.

BY E. R. TINKHAM,

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While attending the University of Alberta, at Edmonton, the writer caught a male dragonfly on May 17, 1925, near a small pool in the Valley of the North Saskatchewan River which he provisionally determined as *Tetragoneuria spinigera* (Say). Again in 1931 the writer captured a male *Tetragoneuria* of the same species at Devil's Lake, near Bilby, Alberta, which is about thirty-four miles west of Edmonton. Both locations are about centrally situated in the Parkland Formation, and both support a strictly Boreal fauna. The 1925 specimen was recently determined as *Tetragoneuria spinigera* (Say) by Donald J. Borror of the Ohio State University and these two captures constitute the first Alberta records and the first west of Manitoba. F. C. Whitehouse, in his paper, "Dragonflies (Odonata) of Alberta (With Descriptive Notes as a Means to Identification)" published by the Alberta Natural History Society, Red Deer, Alberta, 1918, does not mention the genus *Tetragoneuria* as one that may eventually be discovered there, although many species are listed as "not recorded."

Only recently has the presence of *T. spinigera* been definitely known from Manitoba, when E. M. Walker, "The Odonata of Manitoba," Can. Ent., 65(9), 69, 1933, reports it from several localities in that province.

The species is quite common in southeastern Minnesota. With these additional records the distribution of *Tetragoneuria spinigera* (Say) is known from the New England States west to Minnesota and thence north to southern Manitoba and west to Alberta. In the Canadian Prairie Provinces it appears to be restricted to the Parkland Formation. These records substantiate the assumption made by Needham and Heywood, "A Handbook of the Drangonflies of North America," page 181, that the range of this species extends from British Columbia and Washington to Wisconsin and Georgia.

A CONTRIBUTION TO THE INSECT FAUNA OF TIMAGAMI

BY W. A. BROWN,
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(Continued from Page 231)

MECOPTERA.

Identified by F. M. Carpenter, Museum of Comparative Zoology, Harvard, Massachusetts.

PANORPIDAE.

1. *Panorpa signifer* Bks. July 24. G.L.P. Aug. 27. On outside of laboratory.

TRICHOPTERA.

Identified by Nathan Banks.

PHILOPOTAMIDAE.

1. *Chimarrha aterrima* Hag. Aug. 10. S.C.

POLYCENTROPIDAE.

2. *Nyctiophylax vestitus* Hag. Aug. 1. B.I. Grass and flowers on Ball-field; very hot sun.
3. *Allegophylax subfasciata* Say. Sept. 14. I. 315. Inside cottage.
4. *Trichoptera* sp. Aug. 24. B.I. Attracted to light in laboratory. 8.00 p.m.

LEPIDOPTERA.

Identified by J. H. McDunnough, Entomological Branch, Department of Agriculture, Ottawa, Ontario. Nomenclature:—Barnes and McDunnough, "Lepidoptera of Boreal America." Decatur, Ill., 1917.

OECOPHORIDAE.

1. *Agonopteryx klamathiana* Wlsm. Aug. 25. B.I. On verandah of laboratory, 8.00 a.m.
2. *Depressaria heracliana* DeG. June 4. B.I. Attracted to light, 8.00 p.m.

GLYPHIPTERYGIDAE.

3. *Allononyma vicarialis* Zell. Aug. 10 and 28. S.C. On Eupatorium blooms. Aug. 24. B.I. Shady places among coniferous leaves.

TORTRICIDAE.

4. *Epinotia similana* Hbn. Aug. 24. B.I. (Tower Trail) under coniferous shade.
5. *Epinotia solandriana* Linn. Aug. 2. B.I. In laboratory. 11.00 p.m. Aug. 4. K-K-K.B. On surface of water. Aug. 10. S.C. Two copulating on tree-trunk. Aug. 24. B.I. Under coniferous shade.
6. *Epinotia momonana* Kft. Sept. 3. T.I. On balsam in Red Pine stand.
7. *Argyrotoxa albicomana* Clem. July 24. W.L. Red pine rocky type.
8. *Eulia quadrifasciana* Fern. Aug. 5.

PYRALIDIDAE.

9. *Scoparia centuriella* D. & S. Aug. 21. B.I. Attracted to light near laboratory, 10.00 p.m.
10. *Chilo comptulatalis* Hbst. Aug. 2. L.B. Among water-lilies and cat-tails.
11. *Crambus bidens* Z. July 24. W.L. In muskeg.
12. *Crambus innotatellus* Wlk. Aug. 5-21. B.I. Attracted to light near laboratory, 10.00 p.m.
13. *Crambus vulgivagellus* Clem. Aug. 29. G.I. Aug. 24 and Sept. 1. B.I. around laboratory.

14. *Crambus ruricolellus* Z. Aug. 21. B.I. Attracted to light near laboratory, 10.00 p.m.

PTEROPHORIDAE.

15. *Platyptilia pallidactyla* Haw. Aug. 5. B.I. From sweeping in fairly long grass.

GEOMETRIDAE.

16. *Bapta semiclarata* Wlk. June 3. B.I. Grassy opening in wood. June 10. B.I. Tower Trail.
17. *Bapta vestaliata* Gn. June 10. B.I. Tower trail.
18. *Physostegania pustularia* Gn. Aug. 1. B.I. Tower trail; on leaves.
19. *Apaecasia subaequaria* Wlk. June 4. P.B. Plant growth in opening. June 6. E.B.I. Red Pine type.
20. *Hyperetis alienaria* H.-S. June 10. B.I. Tower trail.

SPHINGIDAE.

21. *Hemaris diffinis* Bdv. June 10. E.B.I. Sucking Aralia and Clintonia blooms.

NOCTUIDAE.

22. *Metalestra quadrisignata* Wlk. July 27. B.I. On verandah of laboratory.
23. *Phalaenophana pyramusalis* Wlk. June 10. B.I. Tower trail.
24. *Camptylochila lubricalis* Gey. Aug. 2. L.B. In water lilies and cat-tails. Aug. 17. B.I. Around laboratory, 10.00 p.m.
25. *Autographa rectangula* Kby. July 24. G.L.P. Resting on leaf.
26. *Caenurgia crassiuscula* Haw. June 10. B.I. Tower trail.
27. *Euclidea cuspidea* Hbn. June 5. B.I. Open pasture around rocks.
28. *Enargia decolor* Wlk. Aug. 21. B.I. Attracted to light. Aug. 25. Inside laboratory. Sept. 2. T. Inn. Sept. 24. I. 315. Inside cottage.
29. *Athetis multifera* Wlk. Aug. 17, 27 and 30. B.I. Inside and outside laboratory.
30. *Sidemia devastator* Brace. Aug. 1 and 26. B.I. Inside laboratory.
31. *Polia olivacea* Morr. Aug. 18. B.I. Outside screen of laboratory.
32. *Eurois occulta* Linn. Aug. 28. B.I. Same as for above.
33. *Feltia ducens* Wlk. Aug. 25. B.I. Around laboratory.
34. *Heliothis obsoleta* Fab. Sept. 2. T. Inn.

LITHOSIIDAE.

35. *Lexis bicolor* Grt. Aug. 4. K-K-K.B. On trunk of Red Pine.

HESPERIIDAE.

36. *Thanaos icelus* Lint. June 10. B.I. Tower trail.
37. *Poanes hobomok* Harr. June 10. B.I. Tower trail.

PAPILIONIDAE.

38. *Papilio glaucus* var. *canadensis* R. and J. June 10. Tower trail.

PIERIDAE.

39. *Colias interior* Scud. July 25, ♀. G.L.P. Dock on Temagami L. Aug. 1, ♂. B.I. Tower trail.

LYCAENIDAE.

40. *Strymon liparops* Bdv. Aug. 1. B.I. Tower trail.
41. *Incisalia niphon* Hbn. June 6. E.B.I. Red Pine type. June 11. G.L.P.

42. *Lycaenopsis pseudargiolus* var. *lucia* Kby. June 6. E.B.I. Red Pine type. June 11. G.L.P.
43. *Lycaenopsis pseudargiolus* var. *lucia* form *marginata* Edw. June 6. B.I. Tower trail.

NYMPHALIDAE.

44. *Argynnis atlantis* Edw. Aug. 1. B.I. Tower trail, on flowers.
45. *Brenthis freija* Thun. ♀ June 10. B.I. Tower trail.
46. *Polygonia faunus* Edw. June 11. G.L.P.
47. *Polygonia progne* Cram. June 10. B.I. Tower trail.
48. *Aglais antiopa* L. June 10. B.I. Tower trail.
49. *Aglais j-album* Bdv.-Lec. July 25. G.L.P. Dock on Temagami L.
50. *Vanessa cardui* L. Aug. 1. B.I. Tower Trail.
51. *Vanessa atalanta* L. June 10. B.I. Tower trail.
52. *Basilarchia arthemis* Dru. Aug. 1. B.I. Tower trail.

DIPTERA.

TIPULIDAE.

Identified by Dr. C. P. Alexander, Massachusetts State College, Amherst, Mass.

1. *Limonia canadensis* Westw.
2. *Tricyphona calcar.* O.S.
3. *Tipula fragilis* Lw.
4. *Tipula mingwe* Alex.
5. *Tipula hinei* Alex.

CULICIDAE.

Identified by Alan Stone, Washington.

6. *Aedes intrudens* Dyar. June 7. B.I. Inside laboratory.

PSYCHODIDAE.

Identified by Alan Stone, Washington.

7. *Psychoda severini* Town. Sept. 15. I. 315. Inside window of cottage.

CHIRONOMIDAE.

Identified by Alan Stone and C. T. Greene (*), Washington.

CERATOPOGONINAE.

8. *Ceratopogon peregrinus* Joh. Aug. 21. I. 340. Sweeping Anaphalis and Solidago.
9. *Forcipomyia cilipes* Coq.
10. *Forcipomyia squamipes* Coq.
11. *Forcipomyia pergandei* var. *concolor* Mall? Sept. 15. I. 315. Inside window of cottage.

TANYPINAE.

12. **Tanypus culciformis* L. Aug. 22. I. 340. On Anaphalis.
13. **Chironomus plumosus* L. Aug. 21. I. 340. On Anaphalis.

MYCETOPHILDAE.

Identified by O. A. Johannsen, Department of Entomology, Cornell University, Ithaca, N.Y.

14. *Asindulum montanum* Roed. Aug. 5, and 23. B.I. On Solidago in Ballfield. Aug. 28. Sp. L.P. On Aster; abundant.
15. *Leia opima* Lw. Sept. 15. I. 315. In underbrush under Balsam Fir.

SCIARIDAE.

Determined by C. T. Greene, Washington, and F. R. Shaw, Cornell.

16. *Neosciara* sp. Aug. 20. B.I. Inside laboratory. Aug. 21 and 22. I. 340. Grass, Anaphalis and Solidago.

BIBIONIDAE.

Identified by L. J. Milne, Museum of Comparative Zoology, Harvard, Massachusetts, and by C. T. Greene (*), Washington.

17. *Plecia heteroptera* Say. Sept. 15. I. 315. Underbrush under Balsam Fir
18. *Bibio basalis* Lw. June 4 and 5. Surface of L.T. June 7 and 9. B.I. In alders near lake shore. June 10. E.B.I.
19. **Bibio xanthopus* Wied. June 4 and 5. Surface of L.T.

SIMULIIDAE.

Identified by L. J. Milne, and Alan Stone (*), Washington.

20. *Simulium venustum* Say. June 7, and Aug. 5. B.I.
21. **Simulium decorum* Walk. June 7. B.I.

The following Diptera, unless otherwise indicated, identified by C. H. Curran, American Museum of Natural History, 77th Street and Central Park W., New York City.

STRATIOMYIIDAE.

22. *Pedicella decora* Say. Aug. 20. T.I. Mature pine slope.
23. *Stratiomys badius* Wlk. July 24. W. L. Muskeg Shore of Lake. Aug. 1. B.I. On flowers around Ball-field. Aug. 21, I. 340. On Anaphalis and Solidago.
24. *Lasiopa* sp. June 10. E.B.I. trail.
25. **Beris* sp. (near *annulifera* Bigot). June 9. B.I. In grass, in openings of young Poplar, Birch and Cherry woods.

*Indentified by C. T. Greene, Washington.

TABANIDAE.

26. *Chrysops excitans* Wlk. July 24. W.L. Muskeg shore of lake.
27. *Chrysops niger* MacQ. July 24. W.L. Muskeg shore of lake.
28. *Tabanus nivosus* O.S. July 24. W.L. Muskeg shore of lake.
29. *Tabanus trepidus* McD. July 24. W.L. Muskeg shore of lake.
30. *Tabanus nudus* McD. June 6. B.I. In window of Rangers Hall.
31. **Tabanus thoracicus* Hine. July 24. W.L. Muskeg shore of lake.

*Identified by Alan Stone, Washington.

RHAGIONIDAE.

32. *Rhagio mystacea* MacQ. June 5, 6, 7, and 10. B.I. Around and inside laboratory, on W. Birch by lake shore; also E.B.I.

BOMBYLIIDAE.

33. *Anthrax irrorata* Say. July 27. B.I. On hot sandy path around Baseball field.
34. *Exoprosopa fascipennis* Say. July 27. B.I. On hot sandy path around Baseball field.
35. *Villa fulviana* Say. Aug. 1. B.I. Top of tower hill. Aug. 4. K-K-K.B. Settled on food.
36. *Villa lateralis* Say. July 27. As for *A. irrorata*. Aug. 29. High ridge near G.L.P., on Solidago.

37. *Villa lateralis ater* Paint. July 27. As for *A. irrorata.* Aug. 22. I. 340. On Anaphalis and Solidago.
38. *Bombylius major* L. June 10. B.I. Tower trail.
39. *Bombylius pygmaeus* Fab. June 3. B.I. Openings in young Birch woods. Ovipositing on grass.

THEREVIDAE.

40. *Psilocephala munda.* July 28. On outside of laboratory.

ASILIDAE. LEPTOGASTERINAE.

41. *Cyrtopogon maculipennis* MacQ. July 27. B.I. On hot sandy path around Baseball field.

LAPHRIINAE.

42. *Bombomina posticata* Say. June 10. E.B.I. Hunting on leaves.
43. *Bombomina posticata brunnea* Brom. Aug. 10. B.I. Inside cottage by lake shore.
44. *Bombomina sacrator* Wlk. July 25. G.L.P.

ASILINAE.

45. *Tolmerus notatus* Wied. July 24. W.L. Red Pine and rocks. Aug. 6. B.I. Around laboratory (evening).
46. **Asilus snowii* Hine. July 27. B.I. Baseball field.
*Identified by C. T. Green, Washington.

DOLICHOPODIDAE.

Identified by Mr. M. C. Van Duzee, 12 Abbotsford Place, Buffalo, New York.

SCIAPINAE.

47. *Psilopus* sp. (*caudatus* gp.) Aug. 5. B.I. On flowers round Ball-field trail.

DOLICHOPODINAE.

48. *Dolichopus discifer* Stan. July 23. B.I. Open young growth. July 24. W.L. Muskeg shore of lake.
49. *Dolichopus longimanus* Loew. Aug. 2. L.L.P. Aug. 6. Sp. L.P. Aug.
50. *Dolichopus variabilis* Loew. Aug. 5. B.I. Flowers round Ball-field.
51. *Dolichopus* sp. Aug. 29. High ridge near G.L.P. On Solidago.
52. *Gymnopternus* sp. Aug. 2. L.L.P.

EMPIDIDAE.

53. *Hybos slossonae* Coq. Aug. 10. S.C. On Osmunda regalis. Sept. 1. S.P. Sweeping Carex and Chamaedaphne in Black Spruce swamp.
54. *Rhamphomyia bigelowi* Walley. Aug. 10, as for above.
55. **Rhamphomyia irregularis* Lw. July 22. B.I. Ball-field trail.
56. **Rhamphomyia* sp. (near *setosa*).
*Identified by C. T. Greene, Washington .

LONCHOPTERIDAE.

57. *Lonchoptera furcata* Fall. Aug. 15. B.I. Sweeping Hazel, Bracken, etc. warm evening.

PHORIDAE.

58. *Megaselida iroquoiana* Mall. Sept. 19. I. 315. On skinned mouse, dead four days.

PIPUNCULIDAE.

59. *Pipunculus cingulatus* Lw. Aug. 2. L.L.P.
60. *Pipunculus subopacus* Lw. June 9. B.I. In grass, openings of young Poplar, Birch and Cherry woods.

SYRPHIDAE.

61. *Pipiza quadrimaculata* Panz. June 11. G.L.P.
62. *Cnemodon calcarata* Lw. June 6. E.B.I. On blueberry under Red Pine. Aug. 22. I. 340. On Anaphalis and Solidago.
63. *Paragus bicolor* Fab. June 3. B.I. Open pasture, in flowers. Aug. 1. B.I. Openings around Baseball field.
64. *Cartosyrphus pallipes* Lw. Sept. 14.
65. *Cartosyrphus tristis* Lw. June 10. E.B.I. June 11. G.L.P. July 22 and Aug. 1. B.I. Around Baseball field. Aug. 2. L.L.P. Aug. 21 and 22. I. 340. Anaphalis and Solidago.
66. *Baccha fascipennis* Wied. Aug. 29. G.L.P.
67. *Platychirus erraticus* Curran. Aug. 21. I. 340.
68. *Platychirus inversus* Ide. July 25. S.L.P.
69. *Platychirus modestus* Ide. Aug. 22. I. 340.
70. *Melanostoma confusum* Curran. June 5. B.I. Open pasture, around flowers.
71. *Melanostoma pictipes* Bigot. June 6. E.B.I. In mature White and Red Pine woods. June 9. B.I. Grassy opening in young woods. June 10. E.B.I.
72. *Syrphus perplexus* Osburn. July 27. B.I. On flowers, Ball-field trail.
73. *Syrphus similis* Jones. June 3. B.I. Open pasture, in flowers.
74. *Syrphus torvus* O.S. June 6. E.B.I. Mature W. and R. Pine. June 11. G.L.P. Aug. 21 and 22. I. 340. Sept. 15. I. 315. On drying clothes.
75. *Syrphus venustus* Meig. June 9. B.I. In spider's web on Aralia leaf.
76. *Syrphus weidemanni* Johns. Aug. 25. B.I. On outside of laboratory.
77. *Metasyrphus divisus* Will. Aug. 22. I. 340.
78. *Metasyrphus pingreensis* Fluke. Aug. 22. I. 340.
79. *Epistrophe genualis* Will. June 4. H.R.I. On cork of cyanide bottle.
80. *Epistrophe grossulariae* Mg. July 23. B.I. On flowers, open young woods behind Ball-field. July 22 and 27. Ball-field Trail. Sept. 15. I. 315. On drying clothes.
81. *Doros aequalis* Lw. June 11. G.L.P.
82. *Mesogramma marginatum* Say. July 24. W.L. Muskeg shore of lake. July 26. B.I. On Spiraea blooms behind laboratory. July 23. B.I. Around laboratory.
83. *Sphaerophoria menthastri* L. July 23. B.I. On flowers, open young woods behind Ball-field.
84. *Sphaerophoria novae-angliae* Johns. June 11. G.L.P.
85. *Sphaerophoria strigata* Staeg. June 6. E.B.I. Open White Pine stand.
86. *Sphaerophoria robusta* Curran. June 3. B.I. Open pasture, in flowers. July 24. W.L. Muskeg shore. July 26. B.I. On Spiraea blooms behind laboratory. Aug. 1, 5, 15 and 23. B.I. In and around Ball-field. Aug. 21 and 22. I. 340. On Anaphalis and Solidago.

87. *Rhingia nasica* Say. Aug. 15. B.I. On leaves, Ball-field trail.
88. *Volucella bombylans plumata* DeG. July 25. G.L.P.
89. *Sericomyia militaris* Wlk. Aug. 29. High ridge north of G.L.P., on Solidago. Sept. 1. S.P. On beach.
90. *Eristalis arbustorum* L. July 22. B.I. On flowers around laboratory. Sept. 10. B.I. On flowers in Ball-field.
91. *Eristalis dimidiatus* Wied. Aug. 1. B.I. Openings round Ball-field. Aug. 21. I. 340. Aug. 29. High ridge near G.L.P. All on Solidago etc.
92. *Eristalis bastardi* MacQ. July 26. B.I. On Spiraea behind laboratory. Aug. 21. I. 340. On Anaphalis and Solidago.
93. *Eristalis tenax* L. Aug. 21. I.340.
94. *Heliophilus fasciatus* Wlk. Aug. 21. I. 340.
95. *Syritta pipiens* L. July 22. B.I. On flowers around laboratory.
96. *Xylota florum* Fab. July 22. B.I. On flowers around labortory.
97. *Xylota baton* Wlk. June 11. G.L.P.
98. *Xylota ejuncida* Say. July 22. B.I. On flowers round laboratory.
99. *Xylota libo* Wlk. July 25. S.L.P.
100. *Xylota satanica* Big. July 30. D.L. Lurking in sunny spots.
101. *Cyrnorrhina armillata* O.S. June 10. E.B.I.
102. *Spilomyia fusca* Lw. Aug. 1 and 5. B.I. Open sunny places around Ball-field
103. *Temnostoma alternans* Lw. July 26. B.I. On Spiraea behind laboratory.
104. *Temnostoma trifasciata* Rob. June 10. E.B.I. trail.
105. *Temnostoma vespiforme* L. As for T. alternans.

CONOPIDAE.

106. *Physocephala furcillata* Will. Aug. 5. B.I. Open sunny places around Ball-field. Aug. 27. B.I. Flowers behind laboratory.
107. *Zodion nanellum* Lw. July 22. B.I. Flowers around laboratory.
108. *Zodion bimacula* Curr. n. sp. Sept. 2. T. Inn.

PHASIIDAE.

109. *Cistogaster divisa* Lw. Aug. 22. I. 340.
110. *Gymnosoma fuliginosa* Desv. Aug. 22. I. 340. Aug. 23. B.I. On Solidago S. W. end of Ball-field; in cop.
111. *Alophora splendida* Coq. Aug. 1 and 5. B.I. Open sunny places round Ball-field.
112. *Eliozeta flava* Tns. Aug. 22. I. 340.

TACHINIDAE.

113. *Cryptomeigenia simplex* Curr. June 9. B.I. Openings in young birch woods.
114. *Admontia degeerioides* Coq. Aug. 2. L.L.P.
115. *Anachaetopsis tortricis* Coq. Sept. 1. S.P. Black Spruce swamp.
116. *Clistomorpha triangulifera* Lw. Aug. 5. B.I. Sunny places on Ball-field trail.
117. *Siphona cristata* Fab. July 22. B.I. Sunny places on Ball-field trail.
118. *Siphona tenuis* Curr. n. sp. Aug. 1. B.I. Openings around Ball-field.
119. *Cylindromyia dosiades* Wlk. July 22 and 23, Aug. 23. B.I. On flowers around laboratory and Ball-field.

120. *Cylindromyia argentea* Tns. July 22 and 27. B.I. Around laboratory and Ball-field.
121. *Linnaemyia haemorrhoidalis* Fall. Aug. 23. B.I. Around dwelling.
122. *Mericia ampela* Wlk. Aug. 5. B.I. Ball-field trail. Aug. 21. I. 340. On flowers.
123. *Mericia nigripalpis* Toth. Aug. 10. S.C. Aug. 21 and 22. I. 340.
124. *Lypha dubia* Fall. June 10. E.B.I. trail.
125. *Zenillia caesar* Ald. Aug. 10. S.C. Aug. 22. I. 340.
126. *Zenillia confinis* Fall. July 25. W. L.
127. *Zenillia browni* Curr. n. sp. June 6. B.I. Inside Rangers Hall.
128. *Patelloa sylvatica* A. & W. June 6. E.B.I. Open White Pine stand. June 11. G.L.P.
129. *Lydella myoidea* Desv. July 24. W. L. Muskeg shore.
130. *Winthemia fumiferanae* Toch. June 6. E.B.I. Open White Pine stand. June 11. G.L.P.
131. **Winthemia quadripustulata* Fab. sens. str. July 25. G.L.P.
132. *Paradidyma setigera* Coq. Aug. 22. I. 340.
133. *Exorista larvarum* L. Aug. 22. I. 340.
134. *Gonia frontosa* Say.*? June 3. B.I. Warm open spots. June 11, G.L.P.
135. *Peleteria anaxias* Wlk. Aug. 21 and 22. I. 340. Aug. 28. S.C. Sept. 10. B.I. On flowers in Ball-field.
136. *Peleteria iterans* Wlk. Aug. 5. B.I. Settled on hand. Aug. 21. I. 340. Aug. 28. S.C.
137. *Archytas aterrima* Desv. Aug. 5. B.I. Open sunny places around Ball-field trail.
138. *Cnephaliodes algens* Wied. Aug. 1. B.I. On screen of laboratory. Aug. 21. I. 340.
139. *Cnephaliodes pilosa* Toth. July 25. G.L.P.
140. *Epalpus signiferus* Wlk. June 4. Surface of L.T. —6. E.B.I. Blueberry under Red Pine. —9. B.I. Hovering in low grass. —10. B.I. Tower trail. —11. G.L.P.
141. *Bombyliopsis abrupta* Wd. July 26. B.I. On Spiraea behind laboratory.

*Determined by J. M. Aldrich, Washington.

DEXIIDAE.

142. *Rhynchodexia confusa* West. July 22 and 23. B.I. On flowers around Ball-field.
143. *Opsodexia bicolor* Coq. Aug. 2. L.L.P.

SARCOPHAGIDAE. AMOBIINAE.

144. *Amobia aurata* Coq. July 26. B.I. On Spiraea behind laboratory.

MILTOGRAMMIINAE.

145. *Metopia campestris* Fall. June 7. B.I. In gravel pit behind Cemetery Point.
146. *Metopia leucocephala* Rossi. June 10. E.B.I. trail.
147. *Phrosinella fulvicornis* Coq. July 27. B.I. On bare path by Ball-field.
148. *Pachyopthalmus signatus* Meig. June 11. G.L.P. July 23. B.I. Open young woods behind Ball-field. Aug. 22. I. 340. Aug. 29. High ridge north of G.L.P.

SARCOPHAGINAE.

149. *Helicobia helcicis* Tns. Aug. 15. B.I. Sweeping Hazel and Pteris round Ball-field.

150. *Sarcophaga bisetosa* Park. July 25. S.L.P.

151. **Sarcophaga cimbicis* Tns. June 3. B.I. "Darting everywhere in open green spots." June 10. E.B.I. trail. Aug. 22. I. 340.

152. *Sarcophaga exuberans* Pand. June 3. B.I. as for *cimbicis*. Aug. 22. I. 340.

153. *Sarcophaga peniculata* Park. June 3 as for *cimbicis*. June 6. E.B.I. E.B.I. Open White Pine stand. July 22. B.I. Flowers around lab. July 23. B.I. Young open woods. Aug. 21 and 22. I. 340.

154. *Sarcophaga sinuata* Meig. June 3 as for *cimbicis*.

*Determined by J. M. Aldrich, Washington.

CALLIPHORIDAE. PHORMIINAE.

155. *Protocalliphora splendida* MacQ. Aug. 22. I. 340.

156. *Phormia regina* Meig. June 3. B.I. Open ground and rocks. —7. B.I. inside laboratory. —9. B.I. Near horse droppings.

157. *Phormia terraenovae* Desv. June 3 and 7. B.I. Vernandah of laboratory.

CALLIPHORINAE.

158. *Cynomyia cadaverina* Desv. June 5 and July 23. B.I. Open young woods around Ball-field. June 6, July 21, Aug. 1. B.I. Inside laboratory. July 30. McB. Aug. 20. T.I. Mature Pine slope.

159. *Calliphora vomitoria* L. June 10. E.B.I. trail.

160. *Lucilia caesar* L. June 9. B.I. Near horse droppings. Aug. 1. B.I. On flowers around Ball-field.

161. *Phenicia sylvarum* Meig. July 23. B.I. Open young woods behind Ball-field. Aug. 10. S.C.

MUSCIDAE.

162. *Stomoxys calcitrans* L. July 24, Aug. 22. Everywhere.

163. *Musca domestica* L. Aug. 20. T.I. Mature Pine slope. Aug. 22, I. 340.

164. *Pyrellia serena* Meig. June 4. P.B. Settled on hand. —6. B.I. Rangers Hall. —11. G.L.P. July 23. B.I. On flowers round laboratory. —24. W. L. Muskeg shore. Aug 10. S.C.

165. *Mesembrina latreilli* Desv. July 24. W.L. Muskeg shore.

166. *Morellia micans* Macq. June 5. B.I. Hovering around refuse. —9. B.I. Near horse droppings. Aug. 22. I. 340.

167. *Myiospila meditabunda* Fab. June 6. E.B.I. Blueberry and Red Pine. June 10. E.B.I. trail.

ANTHOMYIIDAE. PHAONIINAE.

168. *Phaonia curvipes* Stein. June 10. E.B.I. trail.

169. *Phaonia errans* Stein. Aug. 28. Sp. L.P. On leaves.

170. *Phaonia harti* Mall. June 6. E.B.I. Blueberry and Red Pine. Aug. 2. L.L.P.

171. *Phaonia serva* Fall. July 22 and 23, Aug. 1. B.I. Around Ball-field.

172. *Phaonia brunneinervis* Stn. June 9. B.I. Openings in young Birch woods

MYDAEINAE.

173. **Mydaea rugia* Wlk. June 10. E.B.I. trail.

174. *Helina johnsoni* Mall. July 24. W.L. Muskeg shore.
175. *Helina pectinata* Joh. July 23. B.I. Flowers in open woods behind Ball-field. Aug. 22. I. 340.
176. *Spilaria lucorum* Fall. Aug. 2. L.L.P.
177. *Spilaria multisetosa* Schnabl. July 24. W.L. Red Pine and rocks. Aug. 28. S.L.P. On leaves.

HYDROTAEINAE.

178. *Ophyra leucostoma* Wied. June 3. B.I. In grass in open spots. June 10. E.B.I. trail. July 23. B.I. On flowers, open young woods behind Ball-field. July 24. W.L. Muskeg shore.
179. *Hydrotaea* sp. July 24. W.L. Muskeg shore.

FANNIINAE.

180. *Fannia spathiophora* Mall. Aug. 1. B.I. Openings around Ball-field, on flowers, Aug. 10. S.C. Aug. 20. T.I. Mature Pine slope.
181. *Fannia* sp. Aug. 2. L.L.P.

LISPINAE.

182. *Lispa tentaculata* DeG. Aug. 4. K-K-K.B. Rocky Point.

LIMNOPHORINAE.

183. *Limnophora* sp. s.l. June 9. B.I. In grass, openings in young Birch woods.
184. *Spilogona alticola* Mall. Aug. 29. High ridge north of G.L.P.
185. *Spilogona magnipunctata* Mall. June 9. B.I. In grass, openings in young woods. June 11. G.L.P.
186. *Lispocephala erythrocera* Desv. July 24. W.L. Muskeg shore.
187. *Limnospila albifrons* Zett. Aug. 20. T.I. Mature Pine slope.

COENOSIINAE.

188. *Coenosia nigrescens* Stn. Aug. 21. I. 340. Sweeping.

ANTHOMYIINAE.

189. *Hylemyia alcathoe* Wlk. June 9. B.I. In grass, openings in young woods. Aug. 23. B.I. Near laboratory.
190. *Hylemyia cilicrura* Rond. Aug. 21. I. 340.
191. *Hylemyia coenosiae formis* Stein. Aug. 5. B.I. Sweeping in Ball-field.
192. *Hylemyia* sp. June 4. H.R.I. Settled on hand. Sept. 10. B.I. On flowers in Ball-field.

Miscellaneous unidentified *Hylemyia* spp.

193. *Paregle cinerella* Fall. Aug. 23. B.I. Near laboratory.
194. *Paregle radicum* L. July 22 and 26. B.I. On flowers, chiefly Spiraea, around laboratory.
195. *Pegomyia connexa* Stein. Aug. 20. T.I. Mature Pine slope.

SCATOPHAGIDAE.

196. *Scopeuma furcata* Say. June 9. B.I. Openings in young Birch woods. June 11. G.L.P.
197. *Scopeuma stercoraria* L. June 9. B.I. On horse droppings.

HELOMYZIDAE.

198. *Neoleria leucostoma* Lw. Sept. 23. I. 315. On mouse dead 8 days.

BORBORIDAE.

199. *Borborus equinus* Fall. June 9. B.I. Openings in young Birch woods.
200. *Scatophora carolinensis* Desv. June 9. B.I. Openings in young Birch

woods.

SCIOMYZIDAE.

201. **Neuroctena simplex* Lw. July 24. W.L. Muskeg shore.

202. *Trypetoptera canadensis* Macq. July 30. McB. Settled on W. Pine trunks, revolving wings in sun.

203. **Limnia saratogensis* Fitch. June 9. B.I. Openings in young Birch woods.

204. *Tetanocera rotundicornis* Lw. June 9. B.I. Resting on leaves. Aug. 2. L.L.P.

*Identified by J. M. Aldrich, Washington.

SAPROMYZIDAE.

205. *Lauxania cylindricornis* Fab. June 6. E.B.I. Blueberry and Red Pine —9. B.I. Openings in young Birch woods. —10. E.B.I. trail.

206. *Minettia lupulina* Fab. Aug. 2. L.L.P. Aug. 15. B.I. Sweeping in Ball-field. Aug. 21. I. 340. Sweeping.

207. *Minettia obscura* Lw. June 10. E.B.I. trail.

208. *Sapromyza browni* Curr. n. sp. June 9. B.I. Openings in young Birch woods. Aug. 15. B.I. Sweeping Hazel and Pteris. Aug. 21. I. 340. Sweeping Anaphalis and Solidago.

ORTALIDAE.

Identified by J. M. Aldrich, Washington.

209. *Pseudotephritis vau* Say. July 30. McB. On W. Pine trunks.

MICROPEZIDAE.

210. *Tanypeza luteipennis* K. and S. July 23. B.I. On flowers in open young woods behind Ball-field.

SEPSIDAE.

211. *Sepsis* sp. July 23. B.I. On flowers in open young woods behind Ball-field.

212. *Nemopoda cylindrica* Fab. June 3 and 9. B.I. In grass in open pasture and young open Birch woods.

PSILIDAE.

213. *Chyliza notata* Lw. June 4. Surface of L.T.

EPHRYDIDAE.

214. *Notiphila* sp. Aug. 2. Loon Bay.

CHLOROPIDAE.

215. *Chlorops* sp. Sept. 1. S.P. B. Spruce swamp. Sweeping Carex and Chamaedaphne.

216. **Siphonella oscinina* Fall. Aug. 5. B.I. On flowers, open sunny places around Ball-field trail.

*Identified by J. M. Aldrich, Washington.

DROSOPHILIDAE.

217. *Chymomyza* n. sp. Sept. 1. B.I. On woodpile behind laboratory; fairly numerous.

GEOMYZIDAE.

218. *Anthomyza tenvis* Lw. Aug. 6. S.L.P. Among W. Cedar.

AGROMYZIDAE.

219. *Agromyza* sp. Sept. 15. I. 315. Inside window of cottage.

(To be continued)

ON THE NAMING OF "TRANSITION FORMS" IN LEPIDOPTERA WITH NOTES ON CERTAIN FORMS CAPTURED NEAR LAWRENCE, KANSAS.

BY WILLIAM D. FIELD,

Lawrence, Kansas.

During the past several years there has been much discussion among Lepidopterists on the question of the advisability of employing a system of scientific classification for forms within a species. While other zoologists have looked scoffingly on, Lepidopterists have been giving names to races, local forms, general forms, sexual forms and aberrations for many years. Mr. J. D. Gunder, believing that these names could be arranged into a scientific classification of concepts below species, proceeded to study the named and unnamed variants of North American butterflies and at the completion of his study he presented his classification to the scientific world.[1] Mr. Gunder gives good reasons for the naming of races, local, general, seasonal and sexual forms. However, the classification of these forms he leaves as they have always stood except that he clearly defines the terms. Mr. Gunder next considers the familiar, old, and all too inclusively used term of "aberration" and takes out of the named "abs." certain forms and types of forms which he thinks are unnameable.[2] He coins a new term, "transition form" and applies this term to the forms of aberrations which he considers nameable. Under his term of "transition form" he includes "recurrent individuals within a species or a race which by change of color or by change of pattern graduate with persistent characteristic similarity from parental type to definitely limited variation away from parental type."[3] These "transition forms" may, according to Gunder, be classified under eight terms; melanism, chromatism, albinism, pellucidism, immaculism, albifusism, chromatifusism, and melanifusism.[4]

Mr. T. D. A. Cockerell makes the excellent criticism that it is a simple matter to say that we will name the significant variations which are due to germinal modifications but that it is quite another thing to really do this.[5] Cockerell asks the all important question which the present writer believes has received *too little attention in the consideration of this problem.* This question is, "How can we distinguish these variations, (variations due to germinal modifications) from those which are the direct result of environmental factors?"[6] To illustrate this question Cockerell says that Mr. Gunder rejects 'minor' variations which may be supposed to be due, at least frequently, to lack of sufficient food in the larval state. But the difficulty is that upon inspection it is often impossible to distinguish between the effects of environment and true mutation."[7] Size is very frequently a specific and racial character. Hence how can we say that "minor" individuals or "major" individuals are never "transition forms" when "we already know much about chromosome changes in plant mutations as related to size among plants."[8] Likewise Mr. Gunder recognizes melanism in his system of named

[1]For his latest presentation of this classification see Ent. News, Vol. XLIII, p. 169, 1932.
[2]Ent. News, Vol. XXXIX, p. 201, 1928.
[3]Ent. News, Vol. XLIII, plate VII, opposite p. 169, 1932.
[4]Ibid.
[5]Bull. Brooklyn Ent. Soc., Vol. XXV, p. 9, 1930.
[6]Bull. Brooklyn Ent. Soc., Vol. XXV, p. 9, 1930.
[7] [8]Ibid.

forms, but environmental changes have been shown by many to sometimes cause "aberrations" or "transitions" toward melanism and towards other goals in Lepidoptera.

Mr. Gunder also excludes the naming of venational malformations from his system, but how can we be sure that these malformations are not results of change in germ-plasm which consequently affected the venation? If such would be the case then why could not these venational malformations influence the future progeny or be indicative of the past generations? How is it that some veins are present in various families and genera and absent or changed in shape in others if there were never any changes made in the wings of the forefathers of our present day Lepidoptera by means of germ-plasm? When any such changes did occur they must have occurred through the influence of the germ-plasm and by means of reappearing "transition forms" they must have effected the present day structural variations in venation in the various species.

The whole point that Cockerell, Talbot[9], Klots[10], and others make in this discussion is that under the Gunder system we are only assuming that the specimens we describe as "transition forms" really influence the species. In other words, we do not know whether our variations called "transition forms" are really true "transition forms" or not. If their only difference from typical specimens is in wing pattern and color then how can we say that they can effect a change in the future species? With the knowledge known at the present time about butterflies we cannot say just exactly what causes the changes in color and pattern from the norm in our species in nature.[11] Perhaps chemical or physical changes, not brought about by germ-plasm but by environment, in the mechanism of laying down colors in wings or in the pigments themselves are responsible for some individuals which differ from the norm of the species. If this proved to be the case in some instances then such names would have to be dropped as synonyms. On the other hand if the variations called "transition forms" not only differ from the norm in color and pattern but also if the germ-plasm is affected, that is if the germ-plasm has the power to reproduce these changed colors and patterns in a descendant, then we may say that such individuals are truly "transition forms," and are transitions either between the present and past species or the present and future species.[12] Mr. Klots says that to attempt to state whether any given variant can possibly effect the evolution of its species without exhaustive experiments by a trained worker to accurately determine the genetical status of the variant is useless and misleading.[13]

Mr. Morgan Hebard expresses the opinion which most Entomologists hold when he says, "their complexity, intermingling and variability would lead to a

[9]Ent. News, Vol. XLII, p. 80, 1931.
[10]Ent. News, Vol. XLI, p. 298, 1930.
[11]We know something about variation in color and pattern of one species, *Junonia coenia* Hbn., because very many painstaking breeding experiments and environment experiments have been performed upon this species by Mr. Schrader (see Bull. Southern Calif. Acad. Sci. and Pomona Journal of Zool. and Ent.). He obtained many striking examples by breeding and raising them in various artificial environments and by selective breeding.
[12]Wm. T. M. Forbes (Ent. News, Vol. XLIV, Nov. 1933, p. 242) believes that 100% of the albifusism, chromatifusism and melanifusism genetically studied is due to external disturbance, so far as he knows, by temperature abnormalties! He also believes that 100% of the categories "change of color" so far studied are mendelian!
[13]Ent. News, Vol. XLI, p. 299, 1930.

senseless array of meaningless names, of interest perhaps to the hoarding collector but of no true scientific value"[14] Mr. Gunder's advice to people who hold such an idea is, "those who complain about names of lower concepts should remember that consideration of lower concepts focuses attention and concentrates study on variation. By recognizing variation through names and through tentative classification thereof we aid in the determination of causes."[15] The writer believes that until the problem of causes is solved and until a better classification is found that the only thing for systematic Lepidopterists to do is to name their new variations and classify them to the best of their ability (and when we consider the lack of data upon the germ-plasm of the various variations we see that no one's ability could be very great) in order that our geneticists may know in what ways our variations differ from type or from the norm of the species. Mr. A. Glen Richards Jr. asks whether for forms within the species, it would not be better to let such specimens go nameless until something is known about them?[16] The writer believes, along with Talbot, Cockerell, Gunder and others, that it would not be better to let such specimens go nameless because such specimens should be brought to the attention of geneticists and the best way of cataloguing these specimens is by describing and naming them. Certain data is necessary to help in the solving of the causes and in the problem of whether they can influence the future species or not and these data can only be noted with satisfaction with the help of names for these forms. Mr. Gunder gives five good reasons for naming these forms.

For the reasons given above the writer will make notes in the literature on "transition forms" as he collects them and will describe and name such new "transition forms" as come into his possession. The following remarks are on such transition forms together with a description of two of them which happen to be new.

Eurymus eurytheme Boisd., tr. f. *rudkini* Gunder. This specimen, a female, corresponds with Gunders' description except that the red streaks on the underside of the secondaries in the center of the wing are not pure red in color but are blackish pink. On the underside of the primaries there is a slight suffusion of black in the intercellular spaces which extend out from the base of wing toward marginal row of black spots. This suffusion is heaviest between the upper and lower radial veins and between the lower radial vein and the third median nervule. This specimen was taken on July 13, 1932, a short distance from Lawrence, Kansas, up the south bank of the Kaw river.

Basilarchia archippus Cram., tr. f. *pseudodorippus* Strecker. I took one specimen, a male, which illustrates the final phase of this transition form, on August 2, 1933. This was taken in the same locality as the last. This is, so far as I have been able to find out, the third example of this final phase of *pseudodorippus* known. Besides my own specimen, Mr. Gunder has one, and the type is in the Field Museum in Chicago.

Basilarchia astyanax Fabr., tr. f. **tildeni** nov. tr. f.

Upper side. On the primaries this is distinguished from typical speci-

[14]Ibid, Vol. XL, p. 143, 1929.
[15]Ibid, Vol. XLIII, p. 239, 1932.
[16]Ent. News, Vol. XLII, p. 215, 1931.

mens in being devoid of the usual white and orange spots, these colors are replaced by the black color which is present in the discal and basal areas of typical specimens. The bluish markings (typical form of species), or greenish markings (f. *viridis* Strecker), or sometimes purplish markings (f. *purpuratus* Gunder), usually present are only very faintly indicated in this example by a slight greenish sheen. There is a submarginal band of slightly darker black color. On the secondaries this tr. f. is darker with two instead of three rows of submarginal blue or green spots. The middle row is replaced by black. The inner row of spots which is very much reduced and darker than usual almost disappears in the radial and subcostal interspaces.

Under side. Red spots present as in typical form, but somewhat reduced in secondaries. The first submarginal row of spots is formed into a continuous band. The second submarginal row, usually composed of bluish spots, is replaced by black. Discal area of primaries is purplish. Dark brown near apex. In the discal area of secondaries are present rays of brown color going in toward base of wing from the interspacial orange spots.

Classification: Transition form; melanifusism, near or perhaps final.

Data: *Holotype*, ♂ ; expanse of wings 68 mm. This rare specimen was taken August 11, 1933, in a small wooded area about two miles from Lawrence, Kansas, up the Kaw river. Type in Author's collection.

Notes: Although the type specimen is of the green form *viridis* (Strk.), the greenish, bluish, and purplish specimens which approach this final degree of melanifusism should be called *tildeni*, as Lepidopterists do not consider mere forms of species or forms of races to have transition forms. For simplicity sake all transition forms are placed directly under the species or race. Without asking for permission the author has named this tr. f. in honor of a good friend of his, Mr. J. W. Tilden, a Lepidopterist of Santa Cruz, California.

Phyciodes nycteis Dbl. & Hew. tr. f. **greyi** nov. tr. f.

Upper side. Primaries; maculation shaded over with black scales which are heaviest in limbal area, the brown colored longitudinal central band is nearly obscured leaving only two faintly appearing brown spots to represent this band. One of these spots is opposite the cell and the other is between median nervule and the submedian vein. Only four of the usual eight interspacial light spots in black outer border are present. These four are between the following veins; upper radial vein and lower radial vein, lower radial vein, and median nervule 3, median nervule 3 and median nervule 2, and median nervule 2 and median nervule 1. The discal area and basal areas are not shaded much more than ordinarily. Secondaries; maculation normal, except that the black band along costal margin which is interrupted by two light spots in typical specimens is entirely black in this new tr. f.

Under side. Not different from typical specimens.

Classification: Transition form; melanifusism, near or perhaps intermediate stage.

Data: *Holotype*, ♂ ; expanse of wings 37 mm. Taken by the author on the north west edge of city limits of Lawrence. Date, June 9, 1934. Type in author's collection. Named in honor of a friend, Mr. L. P. Grey, an excelient Lepidopterist of Lincoln, Maine.

Vanessa virginiensis Dru., tr. f. *fulvia* Dodge. One specimen which I believe should be referred to as this was taken by the writer in the same spot and on the same day as the above tr. f. This specimen is probably an early stage of the tr. f. *fulvia*.

Danais plexippus Linn. tr. f. *americanus* Gunder. Two specimens of this were taken by the writer on July 7, 1934. These were taken 1 day after a shower which briefly interrupted a long drouth. Both specimens were freshly emerged ones.

Papilio marcellus Cram., tr. f. *broweri* Gunder. Several specimens of an early stage of this tr. f. were taken by the writer on May 27, 1934, in the hills about Lake View, Douglas Co., Kansas. The anal spots of all these specimens appeared to be orange but examination under a lense shows that many yellow cells are scattered among the normal red ones. This gives an appearance of orange. The underside red markings are normally colored. Gunder's type has the red markings above and below a yellow color.

A NEW AGROTID MOTH FROM SOUTHEASTERN CALIFORNIA*

BY J. MCDUNNOUGH,
Ottawa, Ontario.

Protogygia comstocki n. sp.

Palpi pale ochreous, the second joint heavily sprinkled exteriorly with blackish scaling. Front pale ochreous with slight admixture of black scales. Tegulae with the basal half pale whitish ochre, apical portion light ochreous brown; a slight sprinkling of black scaling which at times forms a more or less distinct line, separating the two areas of color. Patagia and thorax similar in color to upper half of tegulae, the inner edges of the patagia rather broadly whitish, quite heavily sprinkled with black scaling. Abdomen ochreous overlaid with white hairs. Antennae finely fasciculate. Primaries whitish, heavily overlaid, especially in central area with light ochre-brown; costa and inner margin rather heavily sprinkled with black scales, presenting a greyish appearance; veins all outlined by black scaling. A fine black basal dash; ordinary crosslines more or less obsolescent, the t. a. line faintly visible in the fold as a strongly outwardly angled dark line to which a small indistinct, elongate, whitish claviform is attached; t. p. line variably distinct, sometimes indicated by dark dots on the veins, preceded by a vague darker shade-line, squarely exserted opposite the cell and incurved gently in the fold. Orbicular narrowly oval, decumbent, whitish, its apex extended (as usual in the group) to touch the reniform (this feature not constant in the series before me); reniform narrowly lunate, indistinctly outlined in white with central blackish filling. Subterminal and terminal areas with increased whitish suffusion, especially along veins, presenting a somewhat streaked appearance and leaving a large triangle of the ochre-brown color opposite cell and smaller similar areas above anal angle. A terminal row of intravenular black spots. Fringes whitish, faintly checkered with smoky opposite the terminal black dots. Secondaries white with white fringes; a faint dark discal dot and black points on veins 2-4 representing a postmedian line. Beneath white

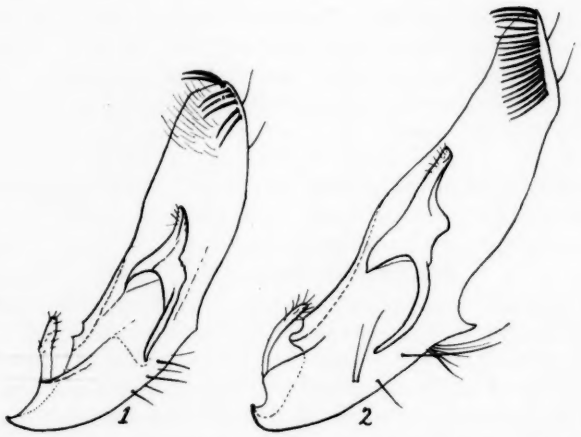
*Contribution from the Division of Systematic Entomology, Entomological Branch, Department of Agriculture, Ottawa.

with slight dark sprinkling along costa of both wings. Dark discal dots present and traces of a dotted postmedian line, crossing both wing; faint dark terminal dots. Expanse, ♂, 36 mm.; ♀, 40 mm.

Holotype—♂, Independence, Inyo Co., Calif., Apr. 22, 1933, (J. A. Comstock); No. 3845 in the Canadian National Collection, Ottawa.

Allotype—♀, same data, in same collection.

Paratypes—2♂, 4♀, same data; 1♂ Mojave Desert, March 24, 1928; 1♀, Red Rock Canyon, Calif., April 21, in Canadian National Collection and Coll. J. A. Comstock.



Right Clasper of 1. *P. comstocki* n. sp.; 2. *P. lagena* Grt.

The species is a paler one than *lagena* Grt. with a coloration somewhat reminiscent of that of a pale *polingi* B. & Benj. It has a much finer basal dash than *lagena* and is without the blackish shading in the cell below the orbicular. In the male genitalia the sharp projection on the midventral margin of the clasper found in *lagena* is lacking and is only represented by the slightest angulation; the harpe is quite similar to that of *lagena* but the apical finger-like projection is much stouter and broader at apex; the corona is weak. There is considerable variation in the males in depth of color and distinctiveness of maculation; some of the females show traces of dark shading on secondaries along outer margin and a punctate dark terminal line. I take much pleasure in naming this interesting species after the collector, Dr. J. A. Comstock, to whom I am indebted for much Californian material and through whose courtesy the types are deposited in the Canadian National Collection.

Mailed Saturday, Dec. 1, 1935.